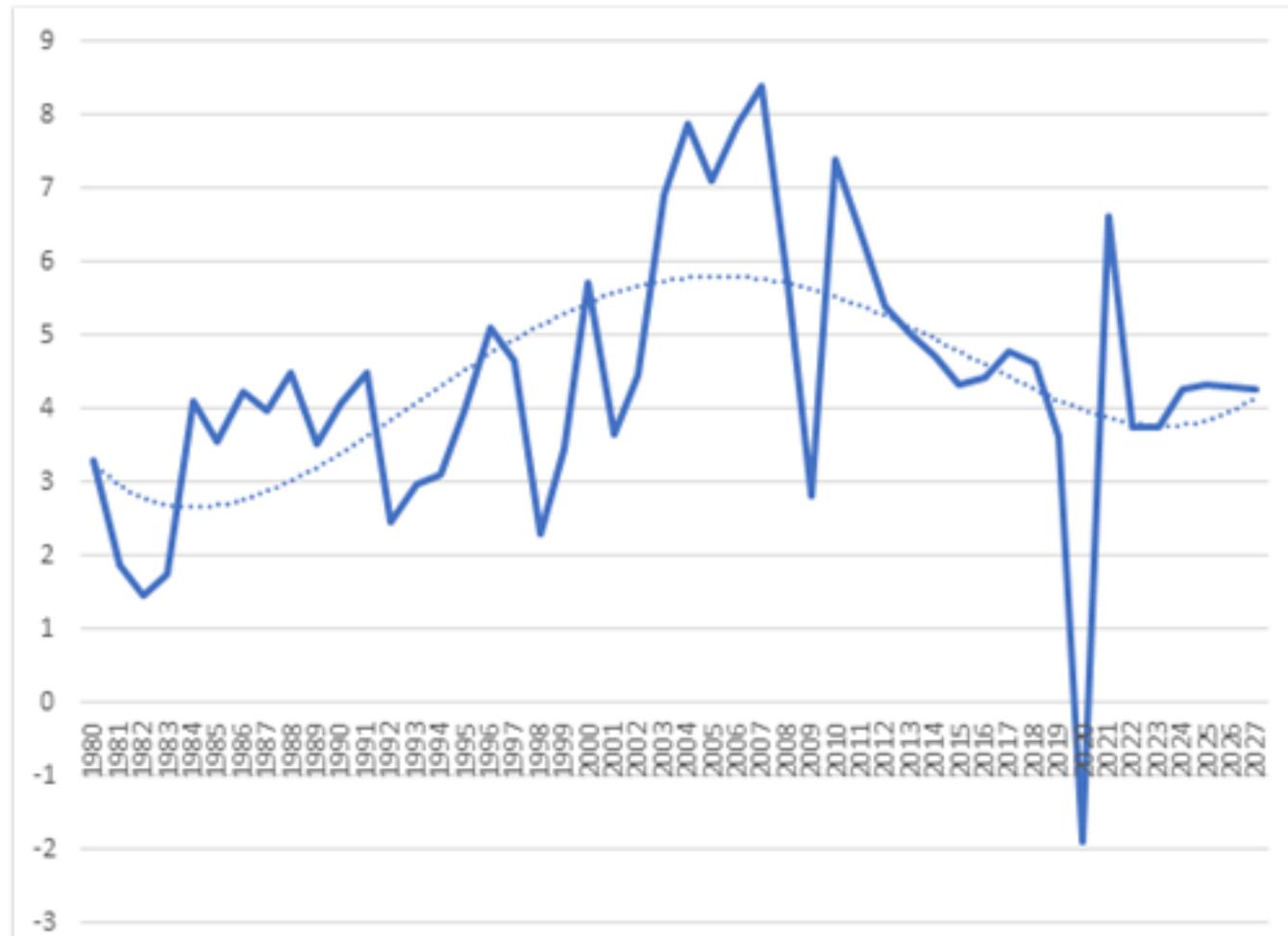# Data Analysis for Global Challenges

ANDREAS ANTONIADES

GDP growth dynamics between MDGs and SDGs
(GDP annual %, constant prices)

Overview

This module offers a hands-on introduction to basic data analysis for students who are averse to numbers, data and statistics. The approach taken is skills-oriented. You will learn where to access and how to use data on key socio-economic and environmental dynamics, how to create your own composite indicators in areas of your interest, how to examine relationships between different socio-environmental trends, how to analyse large textual data, how to read tables reporting statistical results, and how to communicate/visualise the findings of your research.

The module takes place in a PC lab, where you will receive step-by-step guidance on using Excel and NVivo for basic data management and analysis tasks. If you think that numbers/data/datasets 'are not for me', but you feel that these are important skills to have for your future career, do take this module! The module is NOT an introduction to statistics, and NO prior knowledge of statistics or Excel is required.

Indicative learning objectives

-You will learn how to access, download and use large datasets to support or develop research ideas, projects and findings.

-You will learn how to work with and analyse large textual data (using the Qualitative Analysis Software Nvivo).

-You will analyse key challenges to sustainability transition by utilizing different types of data

-You will practice working with data visualizations. (a) to identify patterns in complex data and (b) to communicate effectively research findings to different audiences

-You can tailor the module content to your interests by choosing to focus on specific countries, regions, or groups of countries (e.g. high-income, fragile & conflict affected states, HIPC etc), as well as on specific sustainability transition challenges (e.g. poverty, education, health, conflict & war etc)

For instance, we will review indicators/data used in several SDGs, and you can choose to focus on and use the data/datasets that are closer to your interests (e.g. economic, social, political, environmental etc).
We will also reflect on the use of proxy indicators to measure key sustainability dynamics.

For instance, how to analyze a newly published government report; compare the anti-green policies rhetoric in Germany and the US; or compare the framing of climate change in Indian and Chinese newspapers.

For instance, how to create charts to visualise/present your data, how to use trendlines to identify patterns in complex data, how to experiment with forecasting in Excel etc

Themes & Skills

GROUP A	INDICATIVE THEMES TO BE COVERED
Session 1	Introduction: tipping points, planetary boundaries, UGVC
Session 2	Data, datasets, numbers, visuals, excel
Session 3	Thinking creatively with data: creating your own indicators and indices (Part A) [substantive theme: monetary and multidimensional poverty]
Session 4	Thinking creatively with data: creating your own indicators and indices (Part B) [substantive theme: Global Economic Rebalancing]
Session 5	Exploring Relationships Between Dynamic Global Phenomena [substantive theme: Financial crises and environmental sustainability]
Session 6	Assignment 1 preparation +
Session 7	Exploring Relationships Between Categorical Data: Cross-Tabulations Analysis
Session 8	Working with large textual data – NVivo lab (Part A)
Session 9	Working with large textual data – NVivo lab (Part B)
Session 10	Students' presentation (Assignment 3 – webinars)

Teaching Method

There will be ten three-hour workshops. The main method of teaching will be task-based. In most workshops, participants, guided and supported by the module convenor, will work on specific data-related hands-on tasks individually and/or in groups. All lessons take place in a PC lab.

Students are expected to read at least two core texts (the required readings) before each workshop and prepare for the class tasks (specified in the canvas site). The exact structure and content of each workshop will be outlined during the first seminar.

The module assessment structure allows for frequent feedback, thus facilitating constant improvement throughout the semester.

No specific background is required to join this class. The primary target group for this module is students who typically do not use data or graphs in their essays. In fact, the module is designed for students with no background in quantitative research methods. If you do have experience with quantitative research methods, please consult with the convenor before enrolling, as it may not be the best learning option for you.

Module Assessment

Type	Weight	Submission deadline
Report 1 (max. 1000 words)	25%	Week 6
Report 2 (max. 1000 words)	25%	Week 9
Group presentations/webinars (4-9 min + q&a)	20%	Week 10
Report 3 (max. 1100 words)	30%	Assessment Block
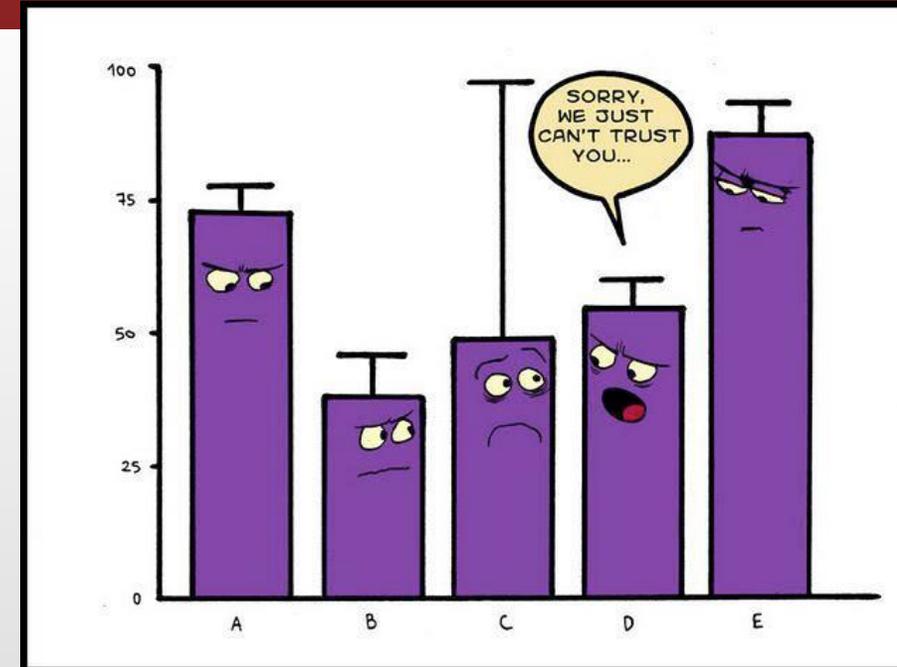
"The idea is to not only grow our piece of the pie, but to expand into other nearby pastries."

Related readings

Indicative theme-based readings from the first weeks (subject to change)

▪ Wackernagel, M. et al (2021). The importance of resource security for poverty eradication. Nat Sustain 4, 731–738. https://doi.org/10.1038/s41893-021-00708-4

▪ Richardson, K. et al. (2023). Earth beyond six of nine planetary boundaries. Sci. Adv. 9, eadh2458. DOI:10.1126/sciadv.adh2458.

▪ Antoniades, A. Breaking the Cycle: Financial Stress, Unsustainable Growth, and the Transition to Sustainability. Sustainability 2025, 17, 7830.

NOTE: As you know this is not a module on statistics, so no background knowledge or preparatory reading in data analysis or statistics is required. But if you insist and are curious on how an accessible book on these themes looks like, feel free to check any from the list below (we have e-copies for most of them in the library). Please keep in mind that all 'technical' concepts related to the module will be explained in class.

▪ Christine Dancey and John Reidy, Statistics without Maths for Psychology, Prentice Hall, 2011

▪ David Spiegelhalter, The Art of Statistics: Learning from Data, Pelican Books, 2020.

▪ Gianmarco Alberti, From Data to Insights: A Beginner's Guide to Cross-Tabulation Analysis, CRC Press, 2025 (Routledge has a 25% discount for all its books when you use the code UKHE26)

WE'VE DECIDED TO TAKE BIG DATA TO THE NEXT LEVEL...

HUMONGOUS DATA

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Convenor details and contact info

Andreas Antoniades is a Professor in Global Political Economy and Sustainability in the Department of International Relations. He is a qualitatively trained social researcher with expertise in global debt dynamics, financial crises, sustainability, and theories of hegemony. One of his favourite questions is : 'how have we been trapped in our own history?'

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